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Thermographic study of reactions between ethylene glycol phosphorous acid and alkyl halides

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Abstract

1. A thermographic study of the isomerization of mixed ethylene glycol esters of phosphorous acid under the action of alkyl halides shows that in harmony with the data of A. E. Arbuzov and N. A. Razumova, the reaction proceeds in two steps which are accompanied by exothermic effects. The thermographic records do not definitely indicate the step of addition of alkyl halide. The first step is characterized by rupture of the ring and formation of a mixed alkyl β-haloethyl ester of alkylphosphonic acid. The second step leads with separation of the alkyl halide) to formation of the ethylene glycol ester of the alkylphosphonic acid. 2. When the substances are heated slowly (0.4° per minute) the thermograms reveal two exothermic effects. When heating is at the rate of 4-5° per minute, the two effects merge into a single exothermic effect. 3. The thermographic method provides the possibility of studying the influence of the ester radical of the mixed ethylene glycol ester of phosphorous acid and of the alkyl halide upon the rearrangement reaction. Alkyl iodides react at lower temperatures and with a greater exothermic effect than alkyl bromides. © 1957 Consultants Bureau.

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